Patent Claims

1. A heat exchanger, in particular for motor vehicles, for a first flow medium and a second flow medium, having a tube bundle (3) which includes a multiplicity of tubes (3a), a first tube plate (4) and a second tube plate, a housing (5) and inlet and outlet connection pieces (2, 6) for the first flow medium, the tubes (3a) having tube ends which are held and sealed in the tube plates, and the housing (5) being connected on the one hand to the tube plates so as to form a cooling chamber (9) for the second flow medium and on the other hand at the end sides to the inlet and outlet connection pieces (2, 6), characterized in that the first tube plate (4) and the tubes (3a) are formed integrally.

2. The heat exchanger as claimed in claim 1, characterized in that the first tube plate (12), the tubes (13) and the housing (11) are formed integrally.

3. The heat exchanger as claimed in one of the preceding claims, characterized in that the integrally formed parts are produced by impact extrusion.

4. The heat exchanger as claimed in one of the preceding claims, characterized in that the integrally formed parts are produced by impact extrusion, are preferably produced from an aluminum extrusion alloy.

5. The heat exchanger as claimed in claim 1, 2, 3 or 4, characterized in that the cross section (3b) of the tubes (3a) is round, rectangular or polygonal.

6. The heat exchanger as claimed in one of claims 1 to 5, characterized in that a rounded transition region is provided between the tubes (3a, 13) and the first

tube plate (4, 12), in particular on the outer side of the tubes.

7. The heat exchanger as claimed in one of claims 1 to 6, characterized in that the tubes (3a, 13) have fins or turbulence generators on their inner and/or outer side in order to improve the heat transfer.

8. The heat exchanger as claimed in one of claims 1 to 7, characterized in that the inlet and outlet connection pieces (2, 6; 15, 16) and the tubes (3a, 13) of the tube bundle are arranged aligned with one another.

9. The heat exchanger as claimed in one of claims 1 to 8, characterized in that the inlet and outlet connection pieces (2, 6; 15, 16), the second tube plate (14) and/or the housing (5) are cohesively joined to the integral, impact-extruded part (3, 4; 11, 12).

10. The heat exchanger as claimed in one of claims 1 to 9, characterized in that the housing (5, 11) has an inlet opening (7) and an outlet opening (8) for the liquid flow medium.

11. The heat exchanger as claimed in one of claims 1 to 10, characterized in that charge air can flow through the tubes (3a, 13) and coolant for an internal combustion engine of a motor vehicle can flow through the housing (5, 11).

12. The heat exchanger as claimed in one of the preceding claims, characterized in that the first medium is a liquid or gaseous medium.

13. The heat exchanger as claimed in one of the preceding claims, characterized in that the second medium is a liquid or gaseous medium.

14. The use of the heat exchanger as claimed in one of claims 1 to 13 as a primary cooler or intercooler or cooler for the charge air or the exhaust gas of an internal combustion engine of a motor vehicle.